

CLAIMS

1. Power-split transmission with a variator (1), which is constructed as a toroid or friction wheel variator, as a band or chain variator, as a tapered ring transmission or as a continuous hydrostatic transmission, with a variator output transmission (2) including a planetary gearset (9) and an additional planetary gearset (3) which, connected in the direction of the flux of force in front of the variator, serves as a distribution transmission, and, connected in the direction of the flux of force behind the variator, serves as a summation transmission for the power-splits, in which the variator output transmission (2), the variator (1) and the additional planetary gearset (3) are arranged coaxially, and whereby the spatial arrangement of the variator output transmission (2), the variator (1) and the planetary gearset (3) in the output direction is indicated by one of the following schemata:

Variator (1) - variator output transmission (2) - planetary gearset (3);

Variator (1) - planetary gearset (3) - variator output transmission (2);

Planetary gearset (3) - variator (1) - variator output transmission (2);

Planetary gearset (3) - variator output transmission (2) - variator (1);

Variator output transmission (2) - planetary gearset (3) - variator (1);

Variator output transmission (2) - variator (1) - planetary gearset (3).

2. Power-split transmission according to claim 1, in which the variator (1) is constructed as a reversing toroid variator, thus has two torus disk pairs (4, 5), the spatial arrangement of the variator output transmission (2), the torus disk pairs (4, 5) and the planetary gearset (3) in the output direction is indicated by one of the following schemata:

Disk pair (4) - variator output transmission (2) - disk pair (5) - planetary gearset (3);

Disk pair (4) - planetary gearset (3) - disk pair (5) - variator output transmission (2);

Variator output transmission (2) - disk pair (4) - planetary gearset (3) - disk pair (5);

Planetary gearset (3) - disk pair (4) - variator output transmission (2) - disk pair (5).

3. Power-split transmission with a variator (1), which is constructed as a toroid or friction wheel variator, as a band or chain variator, as a tapered ring transmission or as a continuous hydrostatic transmission, with a planetary gearset (3), which, connected in the direction of the flux of force before the variator, serves as a distribution transmission, and, connected in the direction of the flux of force behind the variator, serves as a summation transmission for the power-splits, in which a countershaft (6) arranged axially parallel and axially staggered in relation to the variator is provided, through which the power of the variator is conducted to the output of the transmission using at least one spur gear step and/or at least one belt or sprocket wheel drive (7, 8), whereby the spatial arrangement of spur gear steps or belt or sprocket wheel drives (7, 8), variator (1) and planetary gearset (3) in the output direction is indicated by one of the following schemata:

Variator (1) - spur gear step (7) - spur gear step (8) - planetary gearset (3);

Variator (1) - spur gear step (7) - planetary gearset (3) - spur wheel set (8);

Planetary gearset (3) - variator (1) - spur gear step (7) - spur gear step (8).

4. Power-split transmission according to claim 3, in which the variator (1) is constructed as a reversing toroid variator, thus has two torus disk pairs (4, 5), the spatial arrangement of spur gear steps or belt or sprocket chain drives (7, 8), variator (1) and planetary gearset (3) in the output direction being indicated by one of the following schemata:

Disk pair (4) - spur gear step (7) - disk pair (5) - spur gear step (8) - planetary gearset (3);

Planetary gearset (3) - spur gear step (7) - disk pair (4) - spur gear step (7) - disk pair (5);

Disk pair (4) - spur gear step (7) - disk pair (5) - planetary gearset (3) - spur gear step (8).

5. Power-split transmission according to one of the preceding claims, characterized in that it is constructed as a geared neutral transmission.

6. Power-split transmission according to one of the preceding claims, characterized in that it is constructed as a single region or two region transmission.

7. Power-split transmission according to one of the preceding claims, characterized in that the planetary gearsets (3, 9) are constructed as plus or minus planetary gearsets.

8. Power-split transmission according to claim 7, characterized in that a gear is provided in overdrive in which no power flows through the variator (1, 4, 5).

9. Power-split transmission according to claim 8, characterized in that the gear is a direct gear or in that a further reduction is attained using planetary stages or spur gear steps or belt and sprocket wheel drives (7, 8).

10. Power-split transmission according to one of claims 8 or 9, characterized in that an additional shifting element (KD) is provided for engaging the gear in which no power flows through the variator (1, 4, 5).

11. Power-split transmission according to one of claims 8 or 9, characterized in that the shifting elements (K1, K2) are closed for engaging the individual ranges for engaging the gear in which no power flows over the variator (1, 4, 5) in two range transmissions.

12. Power-split transmission according to claim 10, including a friction wheel variator (1) with two variator disk pairs (4, 5), characterized in that the variator output transmission (2), including one planetary gearset (9), is arranged between the variator disk pairs (4, 5) and coaxially thereto, wherein the planetary gearset (3) serving as a summation transmission is arranged coaxially to the planetary gearset (9), in that the sun wheel (10) of the planetary gearset (9) of the variator output transmission (2) can be connected with the variator output on the drive side via a clutch (K1) and can be coupled to the housing (14) via a brake (KD), in that the bar (13) of the planetary gearset (9) is connected on the drive side with the drive shaft (12) and on the output side with the variator (1) and the bar (18) of the planetary gearset (3), and in that the gear ring (11) of the planetary gearset (9) is connected on the output side with the sun wheel (15) of the planetary gearset (3), wherein the gear ring (16) of the planetary gearset (3) is connected with the output shaft (17).

13. Power-split transmission according to claim 10, including a friction wheel variator (1) with two variator disk pairs (4, 5), characterized in that the variator output transmission (2) and the planetary gearset (3) are arranged coaxially in relation to the variator (1) and in the direction of the output shaft (17) behind the variator (1), in that the sun wheel (10) of the planetary gearset (9) of the variator output transmission (2) can be connected with the variator output on the drive side via a clutch (K1) and can be coupled to the housing (14) via a brake (KD), in that the bar (13) of the planetary gearset (9) is connected with the drive shaft (12) on the drive side and on the output side with the variator (1), and in that the gear ring (11) of the planetary gearset (9) is connected on the output side to the sun wheel (15) of the planetary gearset (3), wherein the gear ring (16) of the planetary gearset (3) is connected with the drive shaft (17) and the bar (18) of the planetary gearset (3) is connected with the drive shaft (12).

14. Power-split transmission according to claim 12 or 13, characterized in that shifting takes place by closing the clutch (K1) into the driving region and in that the overdrive gear is engaged by closing the brake (KD).

15. Power-split transmission according to claim 11, characterized in that it includes a single-direction friction wheel variator (1), behind which a variator output transmission (2) and a planetary gearset (3), which serves as a summation transmission, are arranged coaxially in the direction of the output shaft (17), in that the sun wheel (10) of the planetary gearset (9) of the variator output transmission (2) is connected on the drive side with the variator output, wherein the gear ring (11) of the planetary gearset (9) is connected on the output side with the sun wheel (15) of the planetary gearset (3), in that the bar (13) of the planetary gearset (9) is coupled to the housing (14), in that the bar (18) of the planetary gearset (3) can be coupled to the housing (14) via a brake (KR) and can be connected on the drive side with the drive shaft (12) via the clutch (K2), wherein the gear ring (16) of the planetary gearset (3) is connected with the output shaft (17) and can be connected with the drive shaft (12) via a clutch (K1) and a clutch (K2), and in that the bar (18) of the planetary gearset (3) can be connected with the gear ring (16) via the clutch (K1).

16. Power-split transmission according to claim 11, including a friction wheel variator (1) with two variator disk pairs (4, 5), wherein a countershaft (6) that is arranged axially parallel in relation to the variator (1) is provided, via which the power of the variator (1) is conducted to the output of the transmission using a belt or sprocket wheel drive (7), arranged between the variator disks (4, 5), and a spur gear step (8), and wherein the planetary gearset (3) serving as a summation transmission is arranged coaxially in relation to the variator (1), characterized in that the sun wheel (15) of the planetary gearset (3) is connected with the output shaft (17), and the bar (18) of the planetary gearset (3) is connected on the drive side with the output of the variator (1) via the spur gear step (7), the shaft (6) and the belt drive (7), in that the gear ring (16) of the planetary gearset (3) can be coupled to the housing (14) via a brake (KR), wherein the bar (18) can be connected on the drive side with the spur gear step (8) via a clutch (K1), and in that a further clutch (K2) is arranged between the variator (1) and the planetary gearset (3) which connects the gear ring (16) with the drive shaft (12).

17. Power-split transmission according to claim 15 or 16, characterized in that the first driving region results by closing the clutch (K1), the second driving region with power-split by closing the clutch (K2), the reverse gear by closing the brake (KR) and the overdrive gear by closing the clutch (K1) and the clutch (K2).